2. The method according to Claim 1, wherein said donor plant, in step (a) is a cereal plant.

3. The method according to Claim 2, wherein said cereal plant is wheat or barley.

4. The method according to Claim 1, wherein a said arabinogalactan protein in step (d) is present in said induction medium at a level of from about 1 mg/liter to about 100 mg/liter of induction medium.

5. The method according to Claim 4, wherein said arabinogalactan protein is present in said induction medium at a level of from about 10 mg/liter to about 25 mg/liter of induction medium.

6. The method according to Claim 5, wherein said arabinogalactan protein is present in said induction medium for about two weeks.

7. The method according to Claim 1, wherein, in step (b), said substantial portion of microspores at a uninucleate cell cycle G1 phase comprises from 50% to about 100%.

8. The method according to Claim 1, wherein said pre-treatment conditions in step (b) comprise a temperature of from about 3°C to about 10°C for 3 to 10 days and incubation in an aqueous solution having from about 0.2 mol/liter to about 1.0 mol/liter of sugar alcohol.

9. The method according to Claim 8, wherein said sugar-alcohol is selected from the group comprising mannitol, maltitol, sorbitol, xylitol, and any combination thereof.

10. The method according to Claim 1, wherein said pre-treatment conditions in step (b) comprise incubation in water at a temperature of from about 3°C to about 10°C for 7 to 28 days.

11. The method according to Claim 1, wherein, in step (a), said microspore-containing plant segment is selected from the group consisting of tillers, florets, spikes, anthers, pannicles and tassels.

12. The method according to Claim 1, wherein said microspores, in step (d) are incubated in said induction medium for a period of from about 3 to about 14 days.

13. The method according to claim 1, wherein said induction medium, in step (d), comprises an auxin.

14. The method according to Claim 13, wherein said auxin is phenylacetic acid.

15. The method according to Claim 1, wherein said induction medium, in step (d), comprises glutamine at a level of from about 500 to about 1000 mg/L.

16. The method according to Claim 1, wherein said induction medium, in step (d), additionally comprises ovary co-culture.

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17. (Amended) The method of Claim 16, wherein the microspore containing plant segment, in step (a), is obtained from wheat.

18. (Amended) A method of plant regeneration from microspores comprising the steps of:

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(a) harvesting a microspore-containing plant segment from a donor plant;

(b) incubating said segment under pre-treatment conditions to maintain from about 50% to about 100% of microspores at a uninucleate stage of development;

B

(c) isolating microspores from said segment;

(d) incubating said isolated microspores in an induction medium comprising an auxin and an arabinogalactan protein, to induce the production of embryos;

(e) incubating said embryos in a differentiation medium to produce differentiated embryos; and

(f) regenerating plants from said differentiated embryos

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19. The method of plant regeneration according to Claim 18, wherein step (d) comprises placing embryos on a support.

20. The method according to Claim 19, wherein said support comprises filter paper.

21. The method according to Claim 18, wherein step (c) comprises blending or vortexing said segment in an aqueous solution of about 0.2 mol/liter to about 1.0 mol/liter sugar alcohol.

22. A method for microspore culture of a cereal plant comprising the steps of:

(a) incubating a microspore-containing cereal plant segment in a medium comprising arabinogalactan protein in a quantity of from about 1 mg/liter to about 100 mg/liter, to create embryos; and

(b) regenerating cereal plants from said embryos.

25. A method of introducing a gene of interest into a microspore comprising, introducing a genetic construct comprising said gene of interest into said microspore, said microspore obtained following the steps of pre-treatment (step (b)) and isolation (step (c)) as defined in Claim 1.

26. The method of Claim 25, wherein the step of introducing comprises particle bombardment.

27. The method of Claim 25, wherein the step of introducing comprises *Agrobacterium* mediated transformation.

Please add new Claims 31 and 32 as follows,

31. (New) A method of producing a composition of microspores comprising:

(a) harvesting a microspore-containing plant segment from a donor plant;

(b) incubating said segment under pre-treatment conditions to maintain from about 50% to about 100% of microspores at a uninucleate cell cycle;

(c) isolating microspores from said segment; and

(d) incubating said isolated microspores in an induction medium comprising an arabinogalactan protein to produce said composition of microspores

comprising greater than about 25% viable microspores after a 10 day incubation period.

32. (New) A method of producing a composition of microspores comprising:

(a) harvesting a microspore-containing plant segment from a donor plant;

(b) incubating said segment under pre-treatment conditions to maintain from about 50% to about 100% of microspores at a uninucleate cell cycle;

(c) isolating microspores from said segment; and

(d) incubating said isolated microspores in an induction medium comprising an arabinogalactan protein to produce said composition of microspores comprising greater than about 15% multicellular microspores, after a 10 day incubation period.